

**Amendments to the Claims:**

The listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

**Claim 1 (original) :** A radio wave radar system for obtaining at least one of a distance and a relative speed between a host vehicle and a forward object, comprising:

modulation means for modulating a transmitting radio wave frequency;

means for identifying a phase information and a frequency information of a received reflection wave corresponding to the transmission frequency; and

control means for switching modulation methods in the modulation means depending on variation of the relative speed between the host vehicle and the forward object.

**Claim 2 (currently amended):** ~~A radio wave radar system according to claim 1, further comprising~~ A radio wave radar system for obtaining at least one of a distance and a relative speed between a host vehicle and a forward object, comprising:

modulation means for modulating a transmitting radio wave frequency;

means for identifying a phase information and a frequency information of  
a received reflection wave corresponding to the transmission frequency; and

control means for switching modulation methods in the modulation means  
depending on variation of the relative speed between the host vehicle and the  
forward object; wherein

said system further comprises at least two frequency modulation means  
and signal processing means, the at least two frequency modulation means and  
signal processing means including frequency modulation means and signal  
processing means, which are suitable for a case where the relative speed between  
the host vehicle and the forward object is higher than a predetermined threshold  
value, and frequency modulation means and signal processing means, which are  
suitable for a case where the relative speed between the host vehicle and the  
forward object is lower than a predetermined threshold value[[,]]; and

~~wherein~~ the control means selects the distance and the relative speed  
between the host vehicle and the forward object based on the signal processing  
results obtained from the frequency modulation means and the signal processing  
means.

**Claim 3 (original):** A radio wave radar system according to claim 2,  
wherein the control means selects the signal processing result obtained from the  
frequency modulation means and the signal processing means, which are

suitable for a case where the relative speed between the host vehicle and the forward object is higher than the predetermined threshold value, when the relative speed between the host vehicle and the forward object is higher than a predetermined threshold value, and selects the signal processing result obtained from the frequency modulation means and the signal processing means, which are suitable for a case where the relative speed between the host vehicle and the forward object is higher than the predetermined threshold value, or uses the two kinds of frequency modulation means and signal processing means in combination, when the relative speed between the host vehicle and the forward object is lower than a predetermined threshold value.

**Claim 4 (original):** A radio wave radar system according to claim 3, wherein the control means switches a two-frequency continuous wave (CW) modulation method and a frequency pulse continuous wave (CW) modulation method, the two-frequency CW modulation method alternately modulating two frequencies and being suitable for a case where the relative speed between the host vehicle and the forward object is higher than a predetermined threshold value, and the frequency pulse CW modulation method modulating a constant frequency into at least two types of separate frequencies only for a short time interval and being suitable for a case where the relative speed between the host vehicle and the forward object is lower than a predetermined threshold value.

**Claim 5 (original):** A radio wave radar system according to claim 4, wherein a pulse generation time interval in the frequency pulse CW modulation method is determined on the basis of a phase information of an intermediate frequency signal obtained when the two-frequency CW modulation method is used.

**Claim 6 (original):** A radio wave radar system according to claim 4, wherein the distance between the host vehicle and the forward object is calculated from a phase information of an intermediated frequency signal obtained when the two-frequency CW modulation method is used, and the frequency pulse have the same pulse generation time interval as a reciprocating time for the radio wave signal radiated from the radar to be reflected from the forward object and return.

**Claim 7 (original):** A radio wave radar system according to claim 4, further comprising frequency pulse continuous wave modulation means for performing a modulation such that differences between respective frequencies of frequency pulses are equal.

**Claim 8 (original):** A radio wave radar system according to claim 4, further comprising:

frequency filter means for passing any frequency signal of the intermediate frequency signals obtained by the frequency pulse CW modulation means;

signal converting means for converting amplitudes of the intermediate frequency signals into DC voltage signals; and

signal processing means for detecting existence or nonexistence of the DC voltage signals.

**Claim 9 (original):** A radio wave radar system for calculating a distance or a relative speed between a host vehicle and a forward object, comprising:

modulation means for modulating a transmitting radio wave frequency;

means for identifying a phase information and a frequency information of a received reflection wave corresponding to the transmission frequency;

control means for switching modulation methods in the modulation means depending on variation of the relative speed between the host vehicle and the forward object; and

measuring means for measuring a time difference between a time when the transmission frequency is modulated from an arbitrary frequency to a separate frequency only for a short time and a time when the modulated frequency is received.

**Claim 10 (original):** A radio wave radar system according to claim 9, wherein the control means selects a modulation signal of a two-frequency CW modulation method when an absolute value of the relative speed between the host vehicle and the forward object is equal to or greater than a predetermined value, switches the modulation method into a frequency pulse CW modulation method or uses the two modulation methods in combination when the absolute value of the relative speed is less than a predetermined value.

**Claim 11 (original):** A radio wave radar system for calculating a distance or a relative speed between a host vehicle and a forward object, comprising:

modulation means for modulating a transmitting radio wave frequency;

means for identifying a phase information and a frequency information of a received reflection wave corresponding to the transmission frequency; and

control means for switching a modulation method into a frequency pulse CW modulation method, the frequency pulse CW modulation method modulating an constant frequency into at least two types of separate frequencies only for a short time.

**Claim 12 (original):** A radio wave radar system according to claim 3, wherein the frequency modulation means suitable for a case where the relative speed between the host vehicle and the forward object is higher than the

predetermined threshold value uses the two-frequency CW modulation method of alternately modulating two frequencies.

**Claim 13 (original):** A radio wave radar system according to claim 3, wherein the frequency modulation means suitable for a case where the relative speed between the host vehicle and the forward object is lower than the predetermined threshold value uses a FM-CW modulation method of linearly modulating a frequency.

**Claim 14 (original):** An adaptive cruise control system for controlling brake actuator driving means and accelerator throttle driving means to constantly keep maintaining a distance from a host vehicle equipped with the radio wave radar system on the basis of a distance information from the radio wave radar system according to any one of claims 1 to 13.

**Claim 15 (new):** A radio wave radar system according to claim 1, wherein:

when the relative speed between the host vehicle and the forward object is higher than a predetermined threshold value, the control means selects a first modulation method suitable for a case where the relative speed between the host vehicle and the forward object is higher than the predetermined threshold value; and

when the relative speed between the host vehicle and the forward object is lower than the predetermined threshold value, the control means selects one of i) said first modulation method, and ii) said first modulation method and a second modulation method that is suitable for a case where the relative speed between the host vehicle and the forward object is lower than the predetermined threshold value.

**Claim 16 (new):** A radio wave radar system according to claim 15, wherein:

the control means switches between a two-frequency continuous wave (CW) modulation method and a frequency pulse continuous wave (CW) modulation method;

the two-frequency CW modulation method alternately modulates two frequencies and is suitable for a case where the relative speed between the host vehicle and the forward object is higher than a predetermined threshold value; and

the frequency pulse CW modulation method modulates a constant frequency into at least two types of separate frequencies only for a short time interval, and is suitable for a case where the relative speed between the host vehicle and the forward object is lower than a predetermined threshold value.



**Claim 17 (new):** A radio wave radar system according to claim 16, wherein a pulse generation time interval in the frequency pulse CW modulation method is determined on the basis of a phase information of an intermediate frequency signal obtained when the two-frequency CW modulation method is used.

**Claim 18 (new):** A radio wave radar system according to claim 16, wherein:

distance between the host vehicle and the forward object is calculated from a phase information of an intermediated frequency signal obtained when the two-frequency CW modulation method is used; and

the frequency pulses have the same pulse generation time interval as a reciprocating time for the radio wave signal radiated from the radar to be reflected from the forward object and returned.

**Claim 19 (new):** A radio wave radar system according to claim 16, further comprising frequency pulse continuous wave modulation means for performing a modulation such that differences between respective frequencies of frequency pulses are equal.

**Claim 20 (new):** A radio wave radar system according to claim 16, further comprising:

frequency filter means for passing any frequency signal of the intermediate frequency signals obtained by the frequency pulse CW modulation means;

signal converting means for converting amplitudes of the intermediate frequency signals into DC voltage signals; and

signal processing means for detecting existence or nonexistence of the DC voltage signals.

**Claim 21 (new):** A radio wave radar system according to claim 1,

wherein the control means switches the modulation method to frequency pulse CW modulation, in which a constant frequency is modulated into at least two types of separate frequencies only for a short time.

**Claim 22 (new):** A radio wave radar system according to claim 15,

wherein the frequency modulation means suitable for a case where the relative speed between the host vehicle and the forward object is higher than the predetermined threshold value uses the two-frequency CW modulation method of alternately modulating two frequencies.

**Claim 23 (new):** A radio wave radar system according to claim 15,

wherein the frequency modulation means suitable for a case where the relative speed between the host vehicle and the forward object is lower than the

predetermined threshold value uses a FM-CW modulation method of linearly  
modulating a frequency.